intelligent control on processor

VMXP-6426

DM&P Vortex86MX+ 800MHz

3.5” CPU Module

With

3S/4USB/VGA/LCD/LVDS/AUDIO/3LAN/GPIO/Printer/CF

512MB or 1GB DDR2 Onboard

User’s Manual

(Revision 1.1A)

www.microcomputersystems.com

Chapter 1

Introduction

1.1 Packing List

Product Name	Package
SOM304MX-6426	• HDD 44P (2.0) cable x 1 • RS232 cable x 2 • PRINT cable x1 • USB cable x2 (USB port x 4) • NET 4x2 (2.0) cable x 2 • GPIO cable x 1 • Audio cable x 2 • PS/2 Y cable for KB and Mouse x 1 • Screw Kit x 1
SOM304MP-VP	• SOM304MP-VP CPU Module x1

1.3 Product Description

The SOM304MP-VP, low-power consumption x86 embedded controller is designed to meet 3.5" Form Factor, and integrated with the following features.

- 800 MHz Vortex86MX+ SoC
- Either VGA or TFT/ LVDS LCD support
- 512MB / 1GB DDR2 system memory
- Enhanced IDE (UltraDMA-100/66/33)
- 10/100Mbps Ethernet
- USB 2.0 (host) x4
- Up to 3serial ports
- Parallel port
- 16-bit GPIOs
- HD Audio
- SST NAND Flash Onboard (Opt.)
- 2 watchdog timer
- PWM 16~24 channels
- AMI BIOS
- Single voltage +5V DC
- Support extended operating temperature range of -20°C to +70°C

➢ The SOM304MP-VP embedded controller is designed with backward compatibility in mind, to provide migration path for projects facing end-of-life challenges with their existing x86 based controller. The SOM304MP-VP controller is designed to support legacy software to help extend existing product life cycle without heavy re-engineering.

➢ SOM304MP-VP is suitable for broad range of data-acquisition, Industrial automation, Process control, Automotive controller, AVL, Intelligent Vehicle management device, Medical device, Human machine interface, Robotics, Machinery control and any application that requires small footprint, low-power and low-cost hardware.

2.2 Connectors & Jumpers Location

Connectors

2.3 Connectors & Jumpers Summary

Summary Table

Nbr	Description	Type of Connections	Pin nbrs.
J1	IDE Connector	Box Header, 2.0∅ ,20x2	40-pin
J2	CF Card Master/Slave Select	Pin Header, 2.54∅, 2x1	2-pin
J3	LINE-OUT	Wafer, 1.25∅ , 4x1	4-pin
J4	VGA	D-Sub Female	15-pin
J5	MIC-IN	Wafer, 1.25∅ , 4x1	4-pin
J6	USB 2	USB connector	4-pin
J7	PS/2 Keyboard / Mouse	Mini-DIN Female	6-pin
J8	USB 1	Box Header,2.0∅ , 5x2	10-pin
J9	USB 0/ USB 3	Box Header,2.0∅ , 5x2	10-pin
J10	10/100Base-T Ethernet LAN	RJ45 Connector	8-pin
J11	GPIO (Port 0 / 1 /PWMx16)	Box Header, 2.0∅ ,10x2	20-pin
J12	COM1	D-Sub Male	9-pin
J13	RS-485	Molex Header,2.54∅, 3x1	3-pin
J14	COM3	Box Header, 2.0∅ 5x2	10-pin
J15	PRINT	Box Header, 2.0∅ , 13x2	26-pin
J16	COM4	Box Header, 2.0∅ 5x2	10-pin
J17	LVDS	Pin Header, 2.0∅ 8x2	16-pin
J18	LCD	Box Header,2.0∅ ,22x2	44-pin
J19	Reset	Pin Header, 2,54∅,1x2	2-pin
J20	Power Connector	Terminal Block 5.0∅,2x1	2-pin
J25	LAN1 Enable/Disable	Pin Header, 2.54∅, 2x1	2-pin
J26	LAN1	Pin Header, 2.54∅, 2x1	8-pin
J27	LAN2 Enable/Disable	Pin Header, 2.54∅, 2x1	2-pin
J28	LAN2	Pin Header, 2.54∅, 2x1	8-pin
CF1	Compact Flash	Type I/II CF Connector	50-pin
PWR LED	Power Active LED (Red)	LED-SMD	
IDE-LED	IDE Active LED (Green)	LED-SMD	
LED3 LED5	LAN Link/Active LED (Green)	LED-SMD	
LED4 LED6	LAN Duplex LED (Yellow)	LED-SMD	
SP1	BUZZER		
S1	RESET SWITCH		

J8: USB 1

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	VCC
3	LUSBD1-	4	GND
5	LUSBD1+	6	GND
7	GND	8	GND
9	GGND	10	GGND

J9: USB 0/ USB 3

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	VCC
3	LUSBD3-	4	LUSBD0-
5	LUSBD3+	6	LUSBD0+
7	GND	8	GND
9	GGND	10	GGND

J10: LAN /RJ45

Pin #	Signal Name	Pin #	Signal Name
1	TD+	2	TD-
3	RO+	4	NC
5	NC	6	RO-
7	NC	8	NC

J11: GPIO (Port 0 / Port 1/PWMx16)

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	VCC
3	GP00	4	GP10
5	GP01	6	GP11
7	GP02	8	GP12
9	GP03	10	GP13
11	GP04	12	GP14
13	GP05	14	GP15
15	GP06	16	GP16
17	GP07	18	GP17
19	VCC	20	GND

J18: LCD (DVO) Connector

Pin #	Signal Name	Pin #	Signal Name
1	+3.3V	2	+3.3V
3	LG2	4	LG3
5	LG4	6	LG5
7	NC	8	NC
9	LR0	10	LR1
11	LR2	12	LR3
13	LR4	14	LR5
15	GND	16	NC
17	NC	18	NC
19	NC	20	GND
21	NC	22	NC
23	LB0	24	LB1
25	LB2	26	LB3
27	LB4	28	LB5
29	NC	30	NC
31	LG0	32	LG1
33	GND	34	GND
35	NC	36	LCLK
37	NC	38	LDE
39	NC	40	LHSYNC
41	NC	42	LVSYNC
43	LBACKL	44	LVDDEN

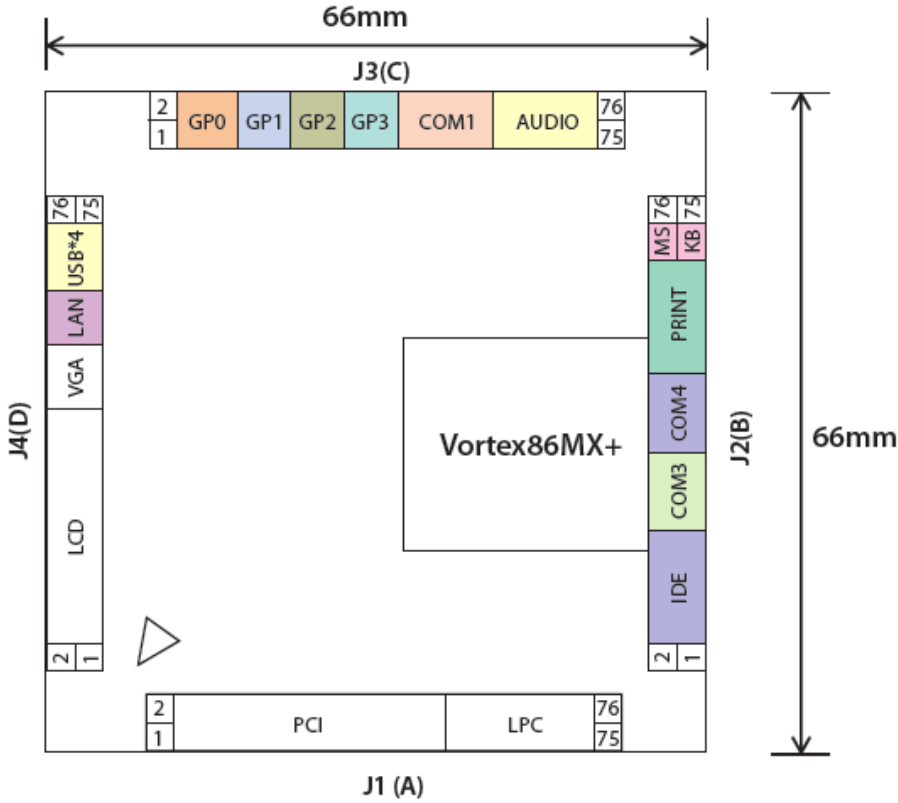
J19: RESET

Pin #	Signal Name	Pin #	Signal Name
1	Reset	2	GND

J20: Power Connector (Terminal Block 5.0mm)

Pin #	Signal Name
1	+5V
2	GND

■ SOM304MP-VP


66mm
J3(C)
2
1
GP0
GP1
GP2
GP3
COM1
AUDIO
76
75
USB*4
LAN
VGA
LCD
MS
KB
PRINT
COM4
COM3
IDE
Vortex86MX+
J4(D)
J2(B)
66mm
PCI
LPC
J1 (A)

2.6 Watchdog Timer

There are two watchdog timers in Vortex86SX/DX/MX+ CPU. One is compatible with M6117D watchdog timer and the other is new. The M6117D compatible watchdog timer is called WDT0 and new one is called WDT1.

We also provide DOS, Linux and WinCE example for your reference. For more technical support, please visit: http://www.dmp.com.tw/tech or download the PDF file: http://www.dmp.com.tw/tech/vortex86dx/

2.7 GPIO (General Purpose Input / Output)

40 GPIO pins are provided by the Vortex86SX/DX/MX+ for general usage in the system. All GPIO pins are independent and can be configured as inputs or outputs, with or without pull-up/pull-down resistors.

We also offer DOS, Linux and WinCE example for your reference. For more technical support, please visit: http://www.dmp.com.tw/tech or download the PDF file: http://www.dmp.com.tw/tech/vortex86dx/

2.8 PWM (Pulse-width modulation)

Pulse-width modulation (PWM) of a signal or power source involves the modulation of its duty cycle, to either convey information over a communications channel or control the amount of power sent to a load.

The popular applications of pulse width modulation are in speed control of electric motors, volume control of Class D audio amplifiers or brightness control of light sources and many other power electronics applications.

The Vortex86DX /Vortex86MX+ SoC integrated 32 channels of PWM interface enabling the Automation, robotic industry to a New Age x86 SoC platform and we also offer the sample code of PWM which will guide the engineer to control the PWM functionality smoothly.

For more inquire of this sample code that please contact our sales team or mail to:
som@icop.com.tw

Chapter 3

Driver Installation

VGA
The Vortex86MX+ processor is integrated RDC Display chip which is an ultra-low powered graphics chipset with total power consumption at around 1-1.5 W. It is capable in providing VGA display output up to 1600x1200. With DVO interface, developers could easily connect flat Panel to support TFT and LVDS output.

LAN
The Vortex86MX+ processor also integrated 10/100Mbps Ethernet controller that supports both 10/100BASE-T and allows direct connection to your 10/100Mbps Ethernet based Local Area Network for full interaction with local servers, wide area networks such as the Internet.

The controller supports: Half / Full-Duplex Ethernet function to double channel bandwidth, auto media detection.

AUDIO
The ALC262 series are 4-Channel High Definition Audio Codecs with UAA (Universal Audio Architecture) featuring two 24-bit stereo DACs and three 20-bit stereo ADCs, they are designed for high performance multimedia desktop and laptop systems. The ALC262 series incorporates proprietary converter technology to achieve over 100dB Signal-to-Noise ratio playback quality; easily meeting PC2001 requirements and also bringing PC sound quality closer to consumer electronic devices.

Operating system support
The Vortex86MX+ 6426 3.5" CPU board supports Embedded software: Free DOS, DOS 6.22, Windows CE 6.0, Windows XP Professional, Windows Embedded standard (XPE) and Windows 2000 (SP4).

Vortex86MX+ 6426 also supports most of the popular Linux distributions, for more detail information, please visit DMP official website: http://www.dmp.com.tw/tech/vortex86mx/

Appendix

A. TFT Flat Panel Data Output

C. LVDS Flat Panel Support

Size	Brand	Resolution	Model No.
5.7”	Ampire	640x480	AM-640480G4TNQW
7”	Ampire	800x480	AM-800480R3TMQW-A1H
8.4”	AUO	800x600	G084SN03
10.4”	AUO	800x600	G104SN02
12.1”	AUO	800x600	G121SN01

F. BIOS Default setting

If the system cannot be booted after BIOS changes are made, Please follow below procedures in order to restore the CMOS as default setting.

- Press **"End"** Key, when the power on

- Press **<Del>** to enter the AMI BIOS setup
- Press **"F9"** to Load Optimized Defaults
- Press **"F10"** to Save configuration changes and exit setup

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.